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Pennsylvania's Manatawny Creek

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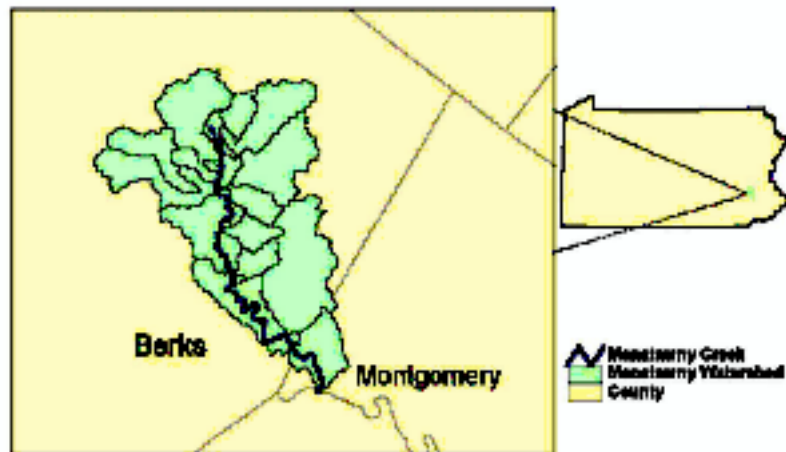
Pennsylvania's Manatawny Creek

Dam Removal on Manatawny Creek Helps Restore Water Quality

Snap Shot

Located on the Manatawny Creek, below Pottstown Memorial Park, there was an orphaned dam that blocked free passage in the Schuylkill River for a number of migratory fish species and contributed to water quality problems such as sediment accumulation due to stagnant flows within the dam pool. Algal blooms were also a pervasive problem in this area, as well as dissolved oxygen levels frequently too low to support aquatic life. To improve water quality and fish passage, the dam was removed, the stream channel was stabilized and riparian buffers were planted. In 2003, the stream was reassessed by the Pennsylvania Department of Environmental Protection (DEP). Based on the presence of pollution sensitive macroinvertebrate populations, two significant segments in the Manatawny Creek watershed were determined to be restored.

Manatawny Creek Watershed



Problem

The Manatawny Creek Watershed covers 91.6 square miles (58,000 acres) including parts of both Berks and Montgomery Counties, and joins the Schuylkill River at Pottstown. In 1987, a Stream Enrichment Risk Analysis (SERA) was performed due to concern for the watershed. While erosion and sedimentation were problems throughout the watershed, they were most significant in conjunction with the orphaned dam. Algal blooms were a pervasive problem in this area, as well as dissolved oxygen levels frequently too low to support aquatic life. For these reasons, along with the results of a SERA survey, several stream miles of the Manatawny Watershed were identified on the 1996 list of impaired waterbodies for not meeting aquatic life water quality goals, as impaired for sediment, nutrients and low dissolved oxygen due to agriculture and the orphaned dam (hydromodification).

In 1997 the Berks County Conservancy, in cooperation with the Montgomery County Lands Trust and a grant from the Keystone Recreation, Park and Conservation Fund, began a Rivers Conservation Plan for the Manatawny Watershed. Among the problems identified in the plan was an orphaned dam below Pottstown's Memorial Park that slowed the stream flow and resulted in accumulated sediment. As a result, the Pennsylvania Fish and Boat Commission removed the orphaned dam in 2000 and restored the flow of the Manatawny through Pottstown's Memorial Park. In addition to the orphan dam, stream bank erosion was also a severe problem in the park with some sections losing 3 to 5 feet of bank a year.



Project Highlights



Source: PA NPS Annual Report

Scientists examining macroinvertebrate population

In 2000, the Delaware Riverkeeper Network was awarded a Section 319 grant for \$90,000 to stabilize and restore the former impoundment and the riparian areas. Approximately 2,000 linear feet of stream channel was stabilized using Natural Stream Channel Design practices including the use of rock vanes. In addition, approximately 2,000 linear feet of riparian buffer were restored along the Manatawny Creek.

The Academy of Natural Sciences also was awarded a \$369,000 Growing Greener grant to assess the potential effectiveness of dam removal as a river restoration method. The Manatawny Creek project was continually monitored by the Academy of Natural Sciences and their research, already completed, documented many of the physical, biological, and chemical changes in the former impoundment of the removed orphan dam. Most of the changes recorded illustrate the changes from a lentic (lake or pond-like) to lotic (stream or river) system. This change was most distinguishable in the fish and macroinvertebrate populations. As a result of this project, the research has produced several reports of value to the science of dam removal. For more information refer to Academy of Natural Sciences website:

<http://www.acnatsci.org/research/pcer/manatawnyprojectinfo.html>

Public education also has taken on several important roles throughout this project. Education dissemination ranged from public outreach meetings on the topic of dam removal, to formal meetings with borough officials and residents concerning riparian vegetation management, to several articles in the Pottstown Mercury covering various aspects of project work and two Watershed Weekly shows produced by Greenworks TV.

In 2003, DEP biologists reassessed the Manatawny Creek and based on the macroinvertebrate population, 20 miles upstream from the mouth and an additional 2.3 miles of an unnamed tributary were found to meet designated water quality standards. The impact from nutrient levels, organic enrichment and thermal modification from the unnamed tributary and the nutrient levels and organic enrichment to the mainstem was significantly reduced, allowing both streams to meet Pennsylvania's water quality goals for aquatic life.



Project Timeline

April 1996—	Manatawny Creek listed as impaired
August 1997—	Rivers Conservation Plan
August 2000 -	First stage of dam removal.
November 2000 -	Second stage of dam removal.
September 2001 -	Phase 1 bioengineering regrade and stabilize
November 2002—	Phase 2 bioengineering and rock vane installation
September 2003—	Restoration is completed
October 2003—	Two segments of Manatawny Creek are determined to be meeting water quality standards



Site of Dam Removal

Source: PA NPS Annual Report

Results

The dam removal and restoration of Manatawny Creek in Pottstown, PA, undertook a comprehensive approach to restoration and has created a successful project in a highly urbanized setting. Twenty miles of the main stem and 2.3 miles of an unnamed tributary were determined to be meeting designated uses as a result of the fish and macroinvertebrate populations present.

Each stage of progress was vital to allowing the stream to naturally recover. First, the dam was removed and a free flowing stream was restored. This allowed free passage to and from the Schuylkill River for a number of migratory fish species. Then the streambank stabilization eliminated excess sediment from depositing in the streambed, covering valuable benthic habitat. It was determined that the stabilization of the streambank reduced 800 tons of sediment per year from entering the Creek. Once the benthic populations had a suitable habitat, they steadily began to repopulate the stream.

The macroinvertebrates sampled during DEP's reassessment were mostly sensitive taxa indicating good water quality in the Manatawny Creek and were equal to or better than the reference CWF stations. Based on the macroinvertebrate population, a total of 22.3 miles of impaired waters in the Manatawny Watershed were reclassified from being impaired for aquatic life use designation to meeting the designated use i.e. restored.

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Nonpoint Source Pollution Program

Partners and Funding

The Pennsylvania Fish and Boat Commission removed the orphaned dam. The Delaware Riverkeeper Network was awarded a Section 319 grant to stabilize and restore the former impoundment and riparian areas. In addition, the Academy of Natural Sciences - The Patrick Center for Environmental Research was awarded a \$369,000 Growing Greener grant to assess the potential effectiveness of dam removal as a river restoration method. Additional partners were Greater Pottstown Watershed Alliance; Borough of Pottstown (Parks and Recreation); U.S. Fish and Wildlife Service; Pennsylvania Department of Environmental Protection; U.S. Environmental Protection Agency's Nonpoint Source Program; Montgomery County Conservation District; Pennsylvania Fish and Boat Commission; Berks County Conservancy.

For more information on nonpoint source pollution and restoration practices, please check out EPA's Region 3 Nonpoint Source Program webpage:

<http://www.epa.gov/reg3wapd/nps/index.htm>

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